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Charles W. Alvord

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER

GREENE, DANIEL LAWSON

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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/671,086
Filing Date: September 25, 2003
Appellant(s): ALVORD ET AL.

MAILED

SEP 21 2007

GROUP 3600

Vincent DeLuca
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 5/30/2007 appealing from the Office action mailed 1/4/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is SUBSTANTIALLY correct. Per the amendment to the specification entered 8/19/2005, the actual flow of cooling water is from the "bottom" of the target to the "top". That is, Figure 1 and paragraph [0009] the specification were amended to clarify that the inlet is actually 102' and thus the coolant flows through a first fluid inlet 406 (not 404) and the outlet is 404 (not 406) as set forth in the specification as filed paragraph [0027]. SEE FIGURE 5 of the drawings as filed, and the errors contained in the last paragraph on page 3 and the second full paragraph on page 4 of Appellants brief filed 5/30/2007.

This defect in appellants brief does not affect the brief in a catastrophic manner. The Examiner has merely pointed it out to aid the board in a proper understanding of the inventions.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5586153	Alvord, C. William	12-1996
6,289,071	Fujiwara et al.	09-2001
5,917,874	Schlyer et al.	06-1999
6,845,137	Ruth et al.	01-2005
6,917,044	Amini	7-2005

Wolf et al., pp360, Radiopharmaceuticals and Labeled Compounds Vol. I, IAEA, Vienna 1973

SATYAMURTHY et al., "Tantalum [180] Water Target for the Production of [18F] Fluoride with High Reactivity for the Preparation of 2-Deoxy-2[18F] Fluoro-D-Glucose, Molecular Imaging and Biology, Jan-Feb 2002, pp. 65-70, Vol. 4

Admitted Prior Art found in Figures 1-3 and paragraphs [0008]-[0010] of the specification as filed.

Definition of the terms "adjacent", "alongside", "beside", "channel", "conduit", "nearby"; pp 14, 32, 108, 190, 240 and 774 respectively, Merriam-Webster's Collegiate Dictionary, Tenth Edition Copyright 2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

A. The instant application is directed towards and/or related to the field of target assemblies for use with accelerators for the production of radioisotopes. More particularly to a target assembly, i.e. an apparatus, for containing a fluid for irradiating Oxygen-18 with protons in order to create Fluorine-18.

A review of the instant application's Figures 1 and 4 indicates remarkable resemblance in structure, the similarities of which are proposed to be **recognizable by one of skill in the art**. A review of Figures 3 and 5 also show remarkable resemblance, however it must be noted that Figure 5 is actually a longitudinal cross sectional view offset from centerline and therefore as Appellant states in the response received 8/19/2005, pages 11 and 12, the inlet and outlet ports and channels shown in Figure 3 are indeed still present in Figure 5. With the figure similarities in mind, it appears that appellants inventive concept merely includes changing the location of the means for cooling the target assembly from the outside of said assembly to the inside of said assembly and selecting an alternate material of construction, both concepts already well known in the art of nuclear transmutation target assemblies as shown and explained in detail below.

B. Claims 37, 38, 40-44, and 46-49 are rejected under 35 U.S.C. 102(a) as anticipated by APA (Admitted Prior Art).

1.) Regarding claims 37, 38 and 44, APA clearly discloses a target assembly comprising:

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a target body (110);

a target chamber (104) formed within said target body, said target chamber having a front window (310), a rear wall opposite said front window, said rear wall being sloped with respect to said front window and a top wall connecting said rear wall to said front window; and

a first and second cooling channel having a first and second cooling fluid inlet at one end (202, 204, 304, 306, 308) of said target body, a first and second cooling fluid outlet at another end of said target body, and a first and second cooling fluid channel conduit formed within said target body coupling said first and second cooling fluid inlet with said first and second cooling fluid outlet, said first and second channel conduits running along at least a portion of said rear wall and along a portion of said top wall; and

(claims 40, 41, 43, 47, 49) an enriched water inlet port (220) formed in said target body, located at an outer surface of said target body substantially parallel to said front window,

(claim 46) an enriched water inlet channel coupled between said target chamber (106) and said enriched water inlet port,

(claims 42, 43, 48, 49) an enriched water outlet port (222) formed in said target body located at an outer surface of said target body substantially parallel to said front window and

(claim 46) an enriched water outlet channel coupled between said target chamber and said enriched water outlet port in, for example, Figures 1-3 and the specification as filed paragraphs [0008]-[0012].

2.) The limitation "a fluid channel conduit formed within said target body" does not define over the structure of APA because the cooling channels (102), (104), (202), (204), (302), (304), etc. are clearly conduits as per the WEBSTER definition of record, because they are indeed a channel (definition also already of record) through which cooling fluid is conveyed and they are indeed defined by or enclosed within at least the outer surface of the target body. It is noted that the claim language does not require the coolant channels to be completely enclosed within, fully enclosed by, or defined inside or internally to the target body, hence Appellant's amendment has not defined over the APA.

Further regarding claims 38, 43, 44 etc. figures 1-3 show at least 7 cooling channels running in parallel to each other and it can be considered that since the channels are divided and run alongside both sides of the target body, then there are at least 14 parallel channels.

Further, the upper portions of the cooling channels (302) and (304) run alongside the upper wall and cooling channels (202) and (204) run alongside the back wall of the target chamber.

Also, there is no patentability in the duplication of parts. Simply duplicating the cooling channels would not create a patentably distinct invention.

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Note that MPEP 2144 states that a making separable, rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961), *In re Japikse*, 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

C. Claims 37-49 are rejected under 35 U.S.C. 102(b) as anticipated by "Tantalum [¹⁸ O] Water Target for the Production of [¹⁸F] Fluoride with High Reactivity for the Preparation of 2-DEOXY-2-[¹⁸F] Fluoro-D-Glucose," by N. Satyamurthy, Bernard Amarasekera, C. William Alvord, Jorge R. Barrio, Michael E. Phelps, in *Molecular Imaging and Biology*, Vol. 4, No. 1, at 65-70 (2002) (hereafter Satyamurthy)

1.) Satyamurthy discloses claims 37, 39, i.e. a TANTALUM target assembly comprising:

a target body (1);

a target chamber (2) formed within said target body, said target chamber having a front window (3), a rear wall (4) opposite said front window, said rear wall being sloped with respect to said front window and a top wall (5) connecting said rear wall to said front window; and

a first cooling channel having a first cooling fluid inlet (6) at one end of said target body, a first cooling fluid outlet (7) at another end of said target body,

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and a first cooling fluid channel conduit (8) formed in said target body coupling said first cooling fluid inlet with said first cooling fluid outlet, said first channel conduit running along at least a portion of said rear wall and along a portion of said top wall; and

(claim 40) an enriched water inlet port (9) formed in said target body, located at an outer surface of said target body substantially parallel to said front window,

an enriched water inlet channel (11) coupled between said target chamber (2) and said enriched water inlet port,

an enriched water outlet port (10) formed in said target body. wherein said enriched water outlet port is located at an outer surface and substantially parallel to said front window and

an enriched water outlet channel (12) coupled between said target chamber and said enriched water outlet port in, for example, Figure 1 as annotated by the examiner and pages 66-69.

The cooling channels of Satyamurthy are clearly defined within the target body and it is considered that at least the closest portion of the cooling channel does indeed run alongside a portion of the upper wall as the claim language does not define over such interpretation. Further the inlet-cooling channel also runs alongside a portion of the back wall of the target chamber as it is considered that at least the closest portion of the cooling channel does run alongside a portion of

the back and upper walls such as two lanes of a highway run alongside each other and the claim language does not define over such interpretation.

Regarding claims 38 and 44, it is considered that from the figure, the upper cooling water outlet arrow indicates one channel and the lower indicates another, another way to look at it is that there are an infinite number of parallel cooling channels disclosed in the Figure because it appears the outlet pipe circumscribes the inlet pipe. Appellant's claim language does not define over the examiners interpretation of the reference. Regardless, there is no patentability in the duplication of parts. Simply duplicating the cooling channels would not create a patentably distinct invention.

Note that MPEP 2144 states that a making separable, rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961), *In re Japikse*, 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

2.) If Appellant is of the opinion that Satyamurthy does not disclose a second cooling channel. At the time of the invention it would have been obvious to one of ordinary skill in the art to include any number of cooling channels in Satyamurthy in order to optimize the cooling of the target body as such is no more in the normal use of cooling methods known in the art.

It is well settled that optimizing a result effective variable, i.e. the amount of cooling, is well within the expected ability of a person of ordinary skill in the subject art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980), In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955).

Further, Note that MPEP 2144 states that a making separable, rearrangement of parts, duplication of parts and/or changing the shape does not make an invention patentably distinct. See *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961), *In re Japikse*, 181 F.2d 1019 86 USPQ 70 (CCPA 1950) and *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975), *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960), *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)

3.) Appellant is again directed to the Satyamurthy reference as evidence that those in the art are clearly aware of the use of Tantalum target systems including "continuous improvements of existing target bodies based on silver target bodies." It appears apparent that Appellant has merely applied the teachings of Satyamurthy to his own prior art Target.

D. Claims 37-49 are rejected under 35 U.S.C. 103(a) as obvious over APA as applied to claims 37, 38, 40-44, and 46-49 above in view of any of Alvord, Fujiwara et al. Schlyer et al., Amini and further in view of Satyamurthy (all references already of record).

1.) Appellant is of the opinion that APA does not disclose cooling fluid channel conduits formed within said target body. Any of the references above

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can be relied upon to show it is clearly known to those of ordinary skill in the art to utilize internal cooling channels to cool whatever portion of the target body needs cooling to ensure it doesn't overheat, warp, etc.

At the time of the invention it would have been obvious to one of ordinary skill to locate the cooling channels of APA internally within said target body for the benefits thereof, i.e. localized cooling, etc. as taught to be notoriously old and well known by the references above.

Regarding claims 39 and 45, APA discloses applicant proposed invention substantially as claimed and described above, however APA does not expressly disclose that the target body is fabricated out of tantalum.

Satyamurthy et al. disclose that there has been more than two decades of ongoing development of cyclotron target bodies for the production of the ^{18}F fluoride ion and discusses the benefits and drawbacks of various materials in the fabrication of said target bodies. Satyamurthy et al. further teaches that the rationale for the choice of tantalum is its relatively low activation by protons and its general chemical inertness and it has a higher thermal conductivity than titanium (another typical target body material)

At the time of applicant's invention, it would have been obvious to one of ordinary skill in the art to fabricate the target body of APA out of tantalum for the benefits of relatively low activation by protons and its general chemical inertness as such is no more than functionally equivalent material.

Further basic thermodynamic principles of engineering can be relied upon to show that when you replace a material that has a high thermal conductivity with a material that has a low thermal conductivity, some method must be employed to account for the change in heat transfer. Accordingly extra or additional or rerouting of the cooling system must be employed.

Accordingly, it would have been obvious to move the cooling channels from the exterior of the target body to the interior in order to move the cooling system closer to the area where the heat is being produced.

Again, upon review of the Figures it is apparent that applicant has merely changed the material of construction to Tantalum (which the Examiner has shown is known in the art) and moved the cooling channels internally to compensate for the lower thermal conductivity of the new material of construction (which is considered to be no more than a basic thermodynamic engineering principle well known in the art as shown by any of the references above).

3.) Further, resort may be had to case law wherein it is OBVIOUS to integrate the cooling channels to the inside of the target body and it is further OBVIOUS to duplicate the cooling channels as such is nothing more than a duplication of parts performing the SAME FUNCTION, i.e. cooling.

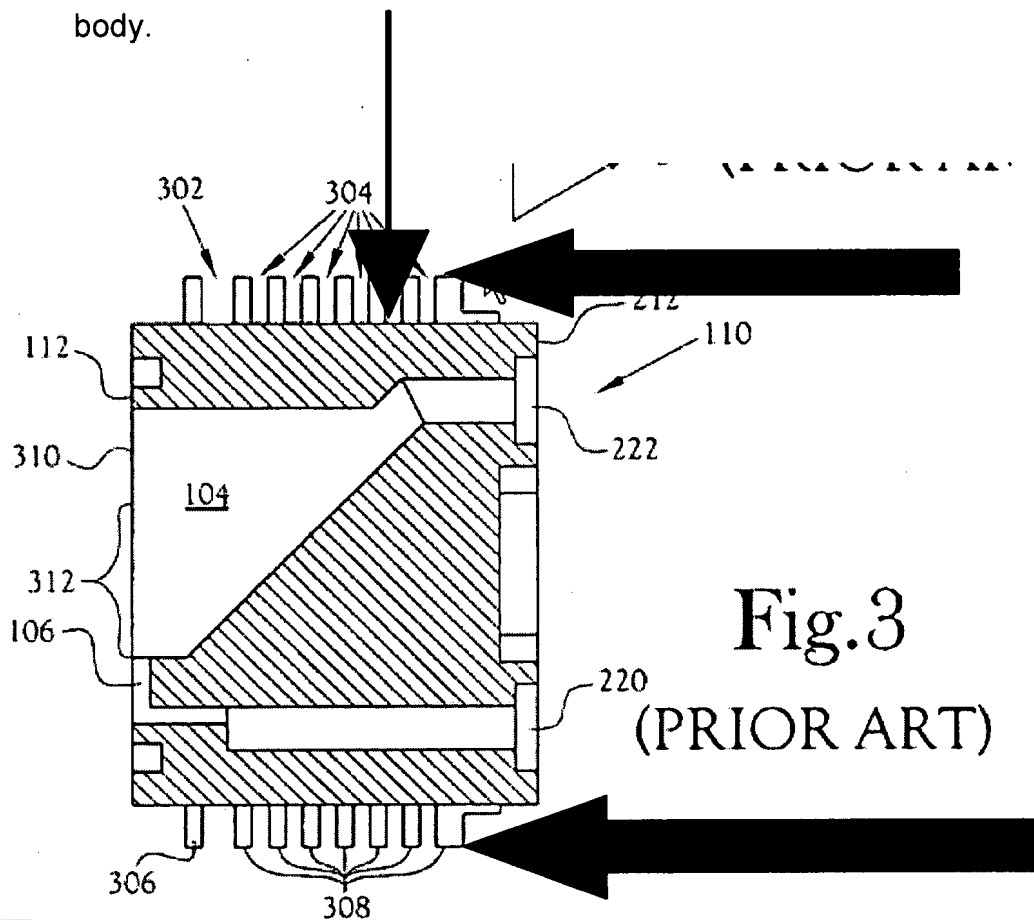
See, for examples, In re Wolfe, 116 USPQ 443, 444 (CCPA 1961)), In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965), In re Harza, 124 USPQ 378 (CCPA 1960) "Mere duplication of parts has no patentable significance unless new and unexpected result is produced"

In this case, only additional cooling would be the result, which IS NOT UNEXPECTED.

(10) Response to Argument

A. The Rejection of Claims 37, 38, 40-44 and 46-49 Is Improper

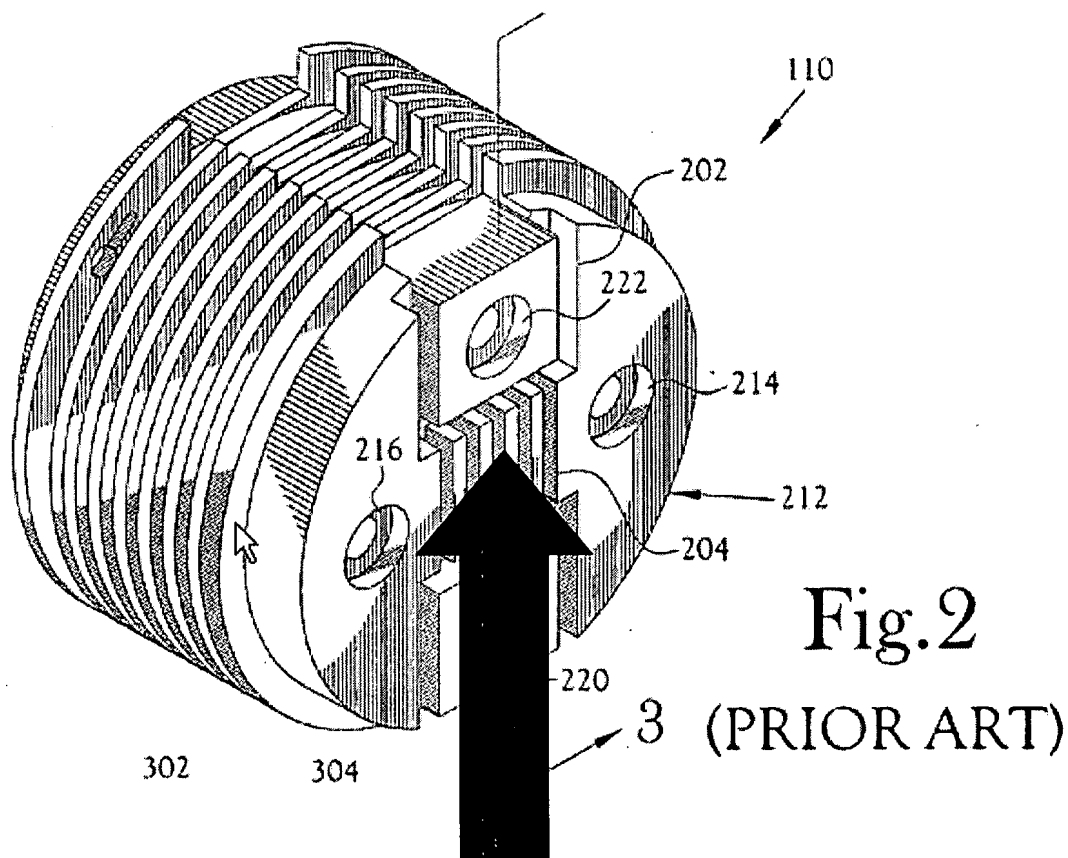
1.) Appellants arguments surrounding the limitation "within" are not considered as defining over the prior art as the cooling channels are indeed within the target body when the outer physical limits of the target body of the prior art are considered as the boundaries defining said target body. Resort may be had to the following figure as the arrow indicates the outer limits of the target body. Accordingly said channels (i.e. (302,304)) are indeed within said target body.



2.) Appellant further argues that the APA target assembly does not contain a cooling channel running along at least a portion of a sloped rear wall of a target chamber as claimed. This limitation can be read in multiple ways:

First, channels 302, 304 are within the circumference of the target body, accordingly the vertical arrow in Fig 3 above indicates a portion of the cooling channel running along a portion of the sloped rear wall.

Second the back of the target also has cooling channels that run alongside a portion of the sloped rear wall as shown in Fig. 2 below.



Again, the cooling channels of the prior art run along at least a portion of the rear wall just as two lanes of a divided highway run along each other, since Appellant has failed to set forth the metes and bounds of the limitations "running along at least a portion of said rear wall" the examiner has given the limitation the broadest reasonable interpretation.

Although the claims are interpreted in light of the specification, limitations from the specification are NOT imported into the claims. The Examiner must give the claim language the broadest reasonable interpretation the claims allow.

See MPEP 2111.01, which states

While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)

B. The Rejections of Claims 37-49 As Being Anticipated or Obvious Over Satyamurthy Are Improper

1.) In response to Appellant's argument that the references fail to show certain features of the invention, it is noted that the features upon which Appellant relies (i.e., that the cooling fluid inlets and outlets are at **respective ends** of the target body) are not recited in the rejected claim(s). Although the

claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). As appellant so aptly states in his 1013/2006 response page 9 "In the context of the specification, "end" means simply at an outside surface of the target body"

Satyamurthy's cooling channel inlet is indeed at one end of the target body and the outlet is at another end because they cannot occupy the same "end" in the broadest sense of the limitation "end" as set forth by Appellant.

2.) Appellant's assertions regarding Satyamurthy disclosing only one large cooling chamber are in err, as that "chamber" can be considered to be a conglomeration of multiple channels, that is to say that that chamber could be cut into any number of channels.

3.) Resort may be had to case law to show that there is no novelty in optimization, especially where as here the optimization would be of the cooling effect.

C. The Rejection of Claims 37-49 As Obvious over APA Is Improper

1.) Appellant argues that there is not a recognizable problem regarding heat with the APA. Resort may be had to the specification as filed, paragraphs [0005-0007] to show that it is indeed known in the target art to have high heat loads. Further, resort may be had to any one of the references to show that cooling is indeed an issue when items are being bombarded with particles. Accordingly, appellant's arguments are simply untenable.

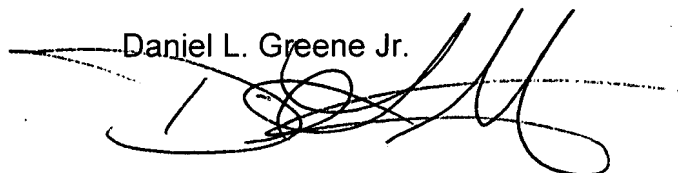
(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

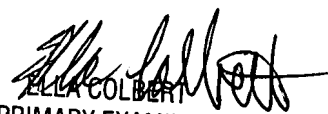
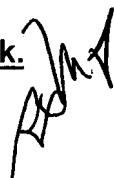
Daniel L. Greene Jr.



Conferees:

(1) Meredith C. Petravick.

(2) Ricardo Palabrica.



ELLA COLBERT
PRIMARY EXAMINER